ABSTRAK

Senyawa 3-(3,4-dimetoksifenil)-1-(4-metoksifenil)prop-2-en-1-on merupakan turunan kalkon yang berpotensi sebagai antijamur, antimalaria, dan pengembalian aktivitas *multidrug resistance*. Senyawa ini disintesis melalui reaksi kondensasi *Claisen-Schmidt* antara 4-metoksiasetofenon dan 3,4-dimetoksibenzaldehida dengan katalis NaOH. Penelitian ini bertujuan mengetahui pengaruh suhu dan durasi waktu sintesis terhadap rendemen menggunakan desain faktorial 2×2 dengan variasi suhu 40°C dan 60°C serta waktu reaksi 1 dan 8 jam. Hasil sintesis menunjukkan produk berupa serbuk kuning dengan jarak lebur 90,9–93,9°C. Uji kromatografi lapis tipis (KLT) dengan menggunakan plat silika gel F_{254} sebagai fase diam dan campuran n-heksana : etil asetat = 9:1 sebagai fase gerak terhadap produk hasil rekristalisasi menunjukkan satu bercak tunggal dengan nilai Rf yang berbeda dari *starting material* sehingga senyawa hasil sintesis dinyatakan murni. Hasil elusidasi struktur menggunakan spektrofotometri, spektrometri massa, spektroskopi ^{1}H-NMR dan ^{13}C-NMR menunjukkan senyawa hasil sintesis adalah 3-(3,4-dimetoksifenil)-1-(4-metoksifenil)prop-2-en-1-on. Uji *Two Way Analysis of Variance* (*ANOVA*) menunjukkan bahwa suhu, durasi, dan interaksi keduanya berpengaruh signifikan terhadap rendemen ($p<0,05$). Rendemen tertinggi diperoleh pada suhu 60°C selama delapan jam (34,09 ± 1,05%).

Kata kunci: 3-(3,4-dimetoksifenil)-1-(4-metoksifenil)prop-2-en-1-on, kondensasi *Claisen-Schmidt*, optimasi suhu, optimasi waktu.

ABSTRACT

3-(3,4-dimethoxyphenyl)-1-(4-methoxyphenyl)prop-2-en-1-one is a chalcone derivative with potential antifungal, antimalarial activities, and the ability to restore multidrug resistance. This compound was synthesized via the Claisen-Schmidt condensation reaction between 4-methoxyacetophenone and 3,4-dimethoxybenzaldehyde using NaOH as a catalyst. This study aimed to evaluate the effects of reaction temperature and duration on yield using a 2×2 factorial design with temperature variations of 40°C and 60°C and reaction times of 1 and 8 hours. The synthesis produced a yellow powder with a melting range of 90.9–93.9°C. Thin-layer chromatography (TLC) analysis of the recrystallized product using silica gel F_{254} plates as the stationary phase and a mixture of n-hexane : ethyl acetate = 9:1 as the mobile phase showed a single spot with an Rf value different from that of the starting materials, indicating that the synthesized compound was pure. Structural elucidation using spectrophotometry, mass spectrometry, and ^{1}H-NMR and ^{13}C-NMR spectroscopy confirmed that the synthesized compound was 3-(3,4-dimethoxyphenyl)-1-(4-methoxyphenyl)prop-2-en-1-one. Two-way Analysis of Variance (ANOVA) revealed that temperature, reaction duration, and their interaction significantly affected the yield ($p<0.05$). The highest yield was obtained at 60°C for 8 hours (34.09 ± 1.05%).

Keywords: 3-(3,4-dimethoxyphenyl)-1-(4-methoxyphenyl)prop-2-en-1-one, Claisen-Schmidt condensation, temperature optimization, time optimization.